

Work Order ID 106280

August-28-13 12:38:46 PM

106280

Page 1

Item ID: D6104-003 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: Round Billet, 17-4
 Start Date: 8/28/13 Start Qty: 12.00 ***12*** Cust Item ID:
 Required Date: 8/28/13 Req'd Qty: 12.00 ***12*** Customer:
 Reference:

Approvals: Process Plan: MLS Date: 13-08-29 Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D6104	Rev B								
100	PURCHASING	0.00							
100									
Purchasing	Memo	0.00							
Purchasing	Issue P/O: <u>21192</u> a)Description: S.S round billet b) Ø3.25" x 3.80" longc) Tolerance on all dimensions are +0.030"/-0.000"d) Material: 17-4PH Stainless steel (Ams 5643 or Aisi 630)e)One blank makes 2 partsf) Material certification required								<u>C213109/04</u> (12)
110	Receive & Inspect for Damage & Mat'l Certs	0.00							
110									
Packaging	Memo	0.00							
Packaging	Ensure material certification is attached								<u>1434/11</u> (12)
120	QC6- Inspect dimensions to drawing	0.00							
120									
QC	Memo	0.00							
Quality Control	Ensure Material certification comply to Dwg D6104								<u>12</u> 0 <u>Jm309-11</u>

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: _____ Date: _____

QA Closed: _____ Date: _____

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <table style="width:100%; border: none;"> <tr> <td style="width:15%;">Skid-tube <input type="checkbox"/></td> <td style="width:15%;">Crosstube <input type="checkbox"/></td> <td style="width:15%;">Water Jet <input type="checkbox"/></td> <td style="width:15%;">Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data <input type="checkbox"/>									
Equip/Tooling <input type="checkbox"/>									
Operator <input type="checkbox"/>									
Material <input type="checkbox"/>									
Setup <input type="checkbox"/>									
Other <input type="checkbox"/>									
Process <input type="checkbox"/>									
Supplier <input type="checkbox"/>									
Training <input type="checkbox"/>									
Unapproved <input type="checkbox"/>									

FAULT CATEGORY

Landing Gear <input type="checkbox"/> Bending <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimped <input type="checkbox"/> Cuffs <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Ripples in Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damaged <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drill Holes <input type="checkbox"/> Drawing <input type="checkbox"/> Finish <input type="checkbox"/> Folio	<input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Offset <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions
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<input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge	<input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
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Work Order ID 106280

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Page 2

August-28-13 12:38:46 PM

Item ID: D6104-003 Accept *N900040100* Setup Start *NS1*
 Revision ID: Stop *NS2*
 Item Name: Round Billet, 17-4
 Start Date: 8/28/13 Start Qty: 12.00 *12* Cust Item ID:
 Required Date: 8/28/13 Req'd Qty: 12.00 *12* Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start *NR1*
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130	Identify as per dwg & Stock Location: MAT 43	0.00							
130									
Packaging	Memo (Billets)	0.00				12	0		JMB-09-11
Packaging									
140	QC21- Final Inspection - Work Order Release	0.00							
140									
QC	Memo	0.00							13/9/13
Quality Control									

13/9/13

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: _____ Date: _____

QA Closed: _____ Date: _____

Work Order: _____ Part No. _____ NCR No. _____				DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update <input type="checkbox"/>		AGAINST DEPARTMENT/PROCESS <div style="display: flex; justify-content: space-between;"> <div> Skid-tube <input type="checkbox"/> Machining <input type="checkbox"/> Thermoforming <input type="checkbox"/> Large Fab <input type="checkbox"/> </div> <div> Crosstube <input type="checkbox"/> Small Fab <input type="checkbox"/> Finishing <input type="checkbox"/> Composite <input type="checkbox"/> </div> <div> Water Jet <input type="checkbox"/> Prod. Eng. Coord. <input type="checkbox"/> Rec/Store/Packaging <input type="checkbox"/> Supplier <input type="checkbox"/> </div> <div> Engineering <input type="checkbox"/> Quality <input type="checkbox"/> Other <input type="checkbox"/> </div> </div>						
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector			
Doc/Data <input type="checkbox"/>												
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Picklist Print

August-28-13 12:38:51 PM

Page 1

Work Order ID: 106280

106280

Parent Item: D6104-003

D6104-003

Parent Item Name: Round Billet, 17-4

Start Date: 8/28/13

Required Date: 8/28/13

Start Qty: 12.00

Required Qty: 12.00

Comments: IPP B: 01.09.04Revised Step 2 SM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6104-003P		Purchased	No			110	Each	0.0000	1	12			
D6104-003P									**				
17-4 SS Roundbar 3.25"OD													

93/9/11 (12)

NCR: Yes / No

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FAULT CATEGORY

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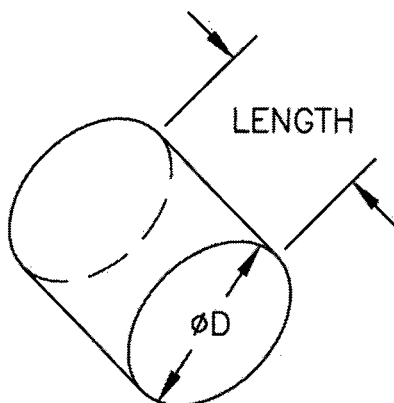


DESIGN RF	DRAWN BY [Signature]	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED [Signature]	APPROVED [Signature]	DRAWING NO. D6104	Rev. B SHEET 1 OF 1
DATE 02.11.25		TITLE ROUND BILLET, 17-4	SCALE NTS
A	01.04.10	NEW ISSUE	
B	02.11.25	CLARIFY ALLOY SPEC ADDED D6104-009/-011 REDUCE LENGTH OF BILLETS	

RELEASED

02.11.29

SPECIFICATION CONTROL DRAWING



13-08-29
5-106286 M.C.S.
[Vertical stamp text]

MATERIAL: 17-4 PH SS (AMS 5643 OR AISI 630) MIN UTS = 170 KSI (38 HRc)

PURCHASE MATERIAL ACCORDING TO THE FOLLOWING TABLE. SPECIFY ALLOY, DIAMETER x LENGTH (+0.030/-0.000) AS SHOWN.

TOLERANCE ON ALL DIMENSIONS IS +0.030/-0.000.

ALL DIMENSIONS ARE IN INCHES

Part No.	Alloy	D (Diameter)	Length
D6104-001	17-4 PH STAINLESS STEEL	Ø3.00	3.80
D6104-003	17-4 PH STAINLESS STEEL	Ø3.25	3.80
D6104-005	17-4 PH STAINLESS STEEL	Ø4.00	5.10
D6104-007	17-4 PH STAINLESS STEEL	Ø4.50	5.10
D6104-009	17-4 PH STAINLESS STEEL	Ø5.25	4.10
D6104-011	17-4 PH STAINLESS STEEL	Ø6.50	4.10

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70 9798 (JC)

Ship From: **THYSSENKRUPP MATERIALS NA**
2821 LANGSTAFF ROAD
CONCORD, ONTARIO L4K 5C6
Tel: 905 669 9444 Fax: 905-738-9033

No: PEC 839743
Ship Date 09Sep13 at 13:23 From PFW
Probill
Via VIM TRANSFER
FOB CONCORD
Frt PREPAID
Route 0- 0 Manifest
Vhcle Trailer
Slp STAN IVERS (905-532-1350)
Sold To: (20115)
DART AEROSPACE
1270 ABERDEEN ST
HAWKESBURY, ON K6A 1K7

Ship To: (1)
DART AEROSPACE
1270 ABERDEEN ST
HAWKESBURY, ON K6A 1K7
Tel: 613-632-9577 Fax: 613-632-1053

B I L L O F L A D I N G					
1) Our Order PEC-602354- 1 Your PO # 21192 STAINLESS STEEL ROUND BAR 17-4 STAINLESS 3.25" DIA X 3.8000"					
Heat Number	Tag No	Quantity	PCS	Wt LBS	
SC0896-G90	214431	3 9.6000 "	12	107	
TOTAL:			Tags 1	PCS 12	LBS 107

ADD ON TO 602288 AND 602289 SUR-CHARGE ADDED

MILL TEST REPORTS, PACKING SLIPS ARE TO SENT WITH MATERIAL AND FAXED TO THE CUSTOMER PRIOR TO SHIPPING.
ATTN: CHANTAL/LINDA
** ALL PACKING SLIPS MUST HAVE THE HEAT NUMBER **
** REFERENCED ON IT **

TOTAL 1 SKID G.W. 132 LBS

*CUSTOMER PICK-UP HRS AT THYSSENKRUPP MATERIALS NA
CONCORD, ONT.* *** 9:00 AM TO 4:00 PM ***
**** TEL. 800-926-2600 ****

* WE STOCK STAINLESS STEEL *
* PLEASE LET US QUOTE YOUR NEXT REQUIREMENT *

***PLEASE NOTE A \$25.00 ENERGY SURCHARGE WILL BE

✓ 1 SKID
100 FL

Page: 1Continued

TOUTES ERREURS ET/OU MARCHANDISES MANQUANTES DOIVENT ETRE
RAPPORTEES IMMEDIATEMENT
ERRORS OR SHORTAGE MUST BE REPORTED IMMEDIATELY
RETOUR DE MARCHANDISES AVEC NOTRE NUMERO D'APPROBATION SEULEMENT
MERCHANDISE MAY NOT BE RETURNED WITHOUT OUR APPROVAL NUMBER

JESSE MACLEOD 2013/09/11
REÇU EN BONNE CONDITIONS / RECEIVED IN GOOD CONDITION
DATE

SHIP FROM: THYSENKRUPP MATERIALS NA
2821 LANGSTAFF ROAD
CONCORD, ONTARIO L4K 5C6
Tel: 905 669 9444 Fax: 905-738-9033

Ship To: (1)
DART AEROSPACE

NO: PEC 839743
SHIP DATE 09Sep13 at 13:23 From PFW
PROBILL
Via VIM TRANSFER
FOB CONCORD
Frt PREPAID
Route 0- 0 Manifest
Vhcle Trailer
Slp STAN IVERS (905-532-1350)
Sold To: (20115)
DART AEROSPACE

B I L L O F L A D I N G

ADDED TO EVERY ORDER.***

THYSENKRUPP MATERIALS NA WILL CONDUCT THEIR
INVENTORY, SEPT. 5 & 6/2013. THERE WILL BE NO
CUSTOMER PICKUPS THOSE DAYS. HOWEVER, THE SALES
OFFICE WILL REMAIN OPEN.

Page: 2 Last

TOUTES ERREURS ET/OU MARCHANDISES MANQUANTES DOIVENT ETRE
RAPPORTEES IMMEDIATEMENT

ERRORS OR SHORTAGES MUST BE REPORTED IMMEDIATELY

RETOUR DE MARCHANDISES AVEC NOTRE NUMERO D'APPROBATION SEULEMENT

MERCHANDISE MAY NOT BE RETURNED WITHOUT OUR APPROVAL NUMBER

REÇU EN BONNE CONDITIONS / RECEIVED IN GOOD CONDITION

DATE



GLORIA MATERIAL TECHNOLOGY CORP. INSPECTION CERTIFICATE

台南市新營區新中路35號
NO.35,HSIN CHUNG RD.,HSIN YING,
TAINAN,TAIWAN
TEL:886-6-6520031
FAX:886-6-6520088

Messrs: ENERGY STEEL PRODUCTS INC.
Order No: 2012004601
FILE NO: 2012004390-B
Grade: 17-4 PH / 630
Size: 3.25"
HEAT-Lot No: SC0896-090
Condition: HR-Solution Annealed-Ground

P.O.NO.: P02195
Date: 07/11/2012
Weight: 1373.0KG 3026.94LB
P'cs: 9

Chemical Composition (wt%)

	C	Si	Mn	P	S	Ni	Cr
Min.						3.0	15.0
Max.	0.07	1.00	1.00	0.040	0.030	5.0	17.5
Result	0.02	0.48	0.62	0.029	0.001	4.3	15.2
	Mo	Cu	Co	Nb+Ta	N	Nb	Ta
Min.		3.0		0.15		SC	
Max.	0.5	5.0		0.45		0.45	
Result	0.2	3.4	0.056	0.23	0.018	0.22	0.012

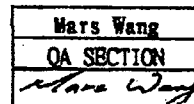
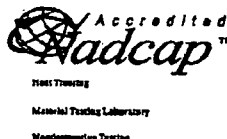
Mechanical Properties Spec.

	Hardness	Grain Size	δ -Ferrite
		ASTM E112	AMS 2315
	1/2R	T	L
Spec.Min.			
Spec.Max.	363HEW		5%
Result	310HEW	7	0.6%

	F500 Hardness(Ave)
	F500
	1/2R L
Spec.Min.	40HRC
Spec.Max.	47HRC
Result	44HRC

Macro Etching

	MACRO ETCH	MACRO ETCH
	ASTM E381	ASTM E381
	B	T
Spec.		
Result	S-2,R-2,G-2	S-2,R-2,G-2



Our quality and environment management systems have been certified by AS9100, ISO9001 QMS, ISO14001 EMS, OHSAS18001 OH&S, and NADCAP. We hereby certify that the material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification. Inspection Certificate comply with EN 10204 3.1.

From: ThyssenKrupp Materials NA

Cust. THYSSENKRUPP MATERIALS NA - ECAD Del.: 2402680478

CstAr CstOr 251612

Wgt.: 107.396 LB Date 09/05/2013

John R. Zambetti



GLORIA MATERIAL TECHNOLOGY CORP. INSPECTION CERTIFICATE

台南市新營區新中路35號
NO.35,HSIN CHUNG RD.,HSIN YING,
TAI NAN,TAIWAN
TEL:886-6-6520031
FAX:886-6-6520088

Messrs: ENERGY STEEL PRODUCTS INC.
Order No: 2012004601
FILE NO: 2012004390-B
Grade: 17-4 PH / 630
Size: 3.25"
HEAT-Lot No: SC0896-G90
Condition: HR-Solution Annealed-Ground

P.O.NO.: P02195
Date: 07/11/2012
Weight: 1373.0KG 3026.94LB
P'cs: 9

Tensile Test

	Elongation(A)	Tensile Strength(Rm)	Yield Strength(0.2% Rp)	Reduction of Area(Z)
	H900	H900	H900	H900
	1/2R L	1/2R L	1/2R L	1/2R L
	(Ave)	(Ave)	(Ave)	(Ave)
Unit	%	KSI	KSI	%
Min.	10	190	170	40
Max.				
Result	12.5	200	179	52

Heat Treatment Condition

Condition	Temperature	Time/hour	Treatment
SOLUTION	1900°F	3.302	FAST COOLING TO BELOW 90 DEGREE F

Non-Metallic Inclusions :AMS 2303E Severity Frequency

Seat		
Max.	0.35	0.4
Result	0	0

Specification:

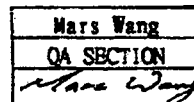
- 1.ASTM A370-10a,A484M-10,A564-10,A388-10,B112-96.
- 2.AMS 5643R,2303E (Mag particle test).
- 3.ASME SA564(04),SA484(04).
- 4.EN 10204 3.1.
- 5.ENERGY SPEC. SS1. REV.5.1 OCT. 1 2011.,

Remark:

- 1.MANUFACTURING PROCESS: BAF+LHF+VOD, FORGED OR HOT ROLLED.
- 2.SOLUTION TREATMENT AT 1900 DEGREE F, FAST COOLING TO BELOW 90 DEGREE F.
- 3.MATERIAL IS FREE FROM MERCURY CONTAMINATION.
- 4.MACRO STRUCTURE OK.
- 5.MICRO STRUCTURE OK.
- 6.NO REPAIR BY WELDING.
- 7.ULTRASONIC TEST OK.
- 8.CAPABILITY MECHANICAL PROPERTIES TESTED AS PER H900 CONDITION.
- 9.ROLLING RATIO:7.5:1.
- 10.THE COUNTRY OF MELT AND MANUFACTURE: TAIWAN.,

This report is a copy of original
mill certificate and verifies
that the product meets the
requirements as originally ordered
by Energy Steel Products.

DATE: 8/13/12 VERIFIED BY: [Signature]



Our quality and environment management systems have been certified by AS9100, ISO9001 QMS, ISO14001 EMS, OHSAS18001 OH&S, and NADCAP. We hereby certify that the material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification. Inspection Certificate comply with EN 10204 3.1.

From: ThyssenKrupp Materials NA

Cust. THYSSENKRUPP MATERIALS NA - ECAD Del.: 2402680478

CstAr CstOr 251612

Wgt.: 107.396 LB

Date 09/05/2013

[Signature: John L. Zambetti]